

WELL-PLATE MICROFLUIDICS**ABSTRACT OF THE INVENTION**

Microfluidic devices and methods for performing a microfluidic process are presented. A microfluidic device conforms with a standard well plate format. The device includes a well plate comprising a plate and an array of wells formed on or in the plate, and a microfluidic structure connecting at least two of the wells. The device can rely exclusively on gravitational and capillary forces that exist in channels within the microfluidic structure when receiving fluid streams. Also disclosed is a microfluidic device having an array of microfluidic structures, each connecting at least two wells of a well plate, and connecting three or more wells in alternative embodiments. With the present invention, a large number of microfluidic processes or reactions can be performed simultaneously.